Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for processing data in an audio data encoder, the data including a sequence of exponent sets each comprising a plurality of exponents, the method comprising the steps of:

determining a first variation of exponent values within a first exponent set;

determining a second variation of exponent values between said first exponent set and each subsequent exponent set in said sequence, wherein the steps of determining the first and second variations are performed utilizing ~~two-layer~~ neural network processing, the neural network processing having first and second neural layers, the first neural layer computing weighted sums of its inputs to determine the first variation, and the second neural layer determining a coding strategy for a selected output from the first neural layer; and

assigning an exponent coding strategy to the first exponent set based on the determined first and second variations.

2. (Previously Presented) The method of claim 1, wherein the exponent coding strategy is assigned from a plurality of exponent coding strategies having different differential coding limits.

3. (Previously Presented) The method of claim 2, comprising a step of coding said first exponent set according to the assigned exponent coding strategy.

4. (Previously Presented) The method of claim 3, comprising a step of assigning an exponent coding strategy to at least one subsequent exponent set based on the corresponding determined second variation.

5. (Previously Presented) The method of claim 4, wherein the plurality of exponent coding strategies includes an exponent set re-use strategy that is assigned to the at least one subsequent exponent set.

6. (Previously Presented) The method of claim 5, comprising a step of coding said first exponent set and said at least one subsequent exponent set according to the corresponding assigned coding strategies.

7-8. (Canceled)

9. (Previously Presented) The method of claim 1, wherein the neural network processing comprises a feature extraction stage in which said sequence of exponent sets is utilized to determine said second variations, a weighted routing stage in which said second variations are weighted according to predetermined weighting values and routed to inputs of the first neural layer, a selection stage in which an output of the first neural layer is selected, and an output processing stage in which a coding strategy is assigned to said first exponent set based on said first variation and the output of said selection stage.

10. (Previously Presented) The method of claim 9, wherein a coding strategy is assigned to at least one subsequent exponent set on the basis of the output of said selection stage.

11. (Previously Presented) The method of claim 10, wherein the coding strategy assigned to the at least one subsequent exponent set is an exponent re-use strategy.

12. (Previously Presented) The method of claim 9, wherein the feature extraction stage comprises determining

$$Adiff(E_i, E_j) = (\Sigma_m |e_{i,m} - e_{j,m}|)/n$$

where Adiff is said second variation,

E_i is said first exponent set and E_j is a subsequent exponent set with $j > i$,

$E_i = (e_{i,0}, e_{i,1}, e_{i,2}, \ldots., e_{i,n-1})$,

$E_j = (e_{j,0}, e_{j,1}, e_{j,2}, \ldots., e_{j,n-1})$,

n is an integer representing the number of exponents in a said set of exponents,

and

$m = 0, 1, 2, \ldots., n-1$.

13. (Previously Presented) The method of claim 12, wherein the processing carried out by the weighted routing stage and first neural layer includes determining

$$Y = \begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \ldots \\ \ldots \\ y_{b-1} \end{bmatrix} = \Gamma\left(\begin{bmatrix} 0 & 0 & 0 & \ldots & \ldots & 0 \\ 0 & w_{1,1} & 0 & \ldots & \ldots & 0 \\ 0 & w_{2,1} & w_{2,2} & \ldots & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \ldots & \ldots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \ldots \\ \ldots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \ldots \\ \ldots \\ T_{b-1} \end{bmatrix} \right)$$

the operator $\Gamma[\bullet]$ is defined as:

$$\Gamma \begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \ldots \\ \ldots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \ldots \\ \ldots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of exponent sets in the sequence comprising said data.

14. (Previously Presented) The method of claim 13, wherein the selection stage comprises selecting an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

15. (Previously Presented) The method of claim 14, wherein the plurality of exponent coding strategies comprises strategies $S_1, S_2, \ldots, S_c$, where $c \leq b$, corresponding to differential coding limits 1, 2, … ,c.

16. (Previously Presented) The method of claim 15, wherein the exponent coding strategy S_γ assigned to said first exponent set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5)$.

17. (Currently Amended) A method for coding audio data having a sequence of exponent sets each comprising a plurality of exponents, the method comprising the steps of:

determining via neural network processing a first variation of exponent values between a first exponent set in the sequence and each subsequent exponent set in said sequence to determine the maximum number of exponent sets that are similar to a given exponent set;

selecting via the neural network processing an exponent coding strategy for said first exponent set from a plurality of exponent coding strategies on the basis of said first variation<u>, the neural network processing having first and second neural layers, the first neural layer computing weighted sums of its inputs to determine the first variation, and the second neural layer determining a coding strategy for a selected output from the first neural layer</u>; and

coding said first exponent set according to the selected exponent coding strategy.

18. (Previously Presented) The method of claim 17, wherein each of the plurality of exponent coding strategies corresponds to a different differential coding limit.

19. (Previously Presented) The method of claim 17, comprising selecting one of said subsequent exponent sets on the basis of said first variation and assigning an exponent re-use coding strategy to the selected exponent set and any exponent sets in said sequence between the first exponent set and the selected exponent set.

20. (Previously Presented) The method of claim 17, comprising a step of determining a second variation between consecutive exponents in said first exponent set, wherein the exponent coding strategy for said first exponent set is selected on the basis of said first and second variations.

21-22. (Canceled)

23. (Currently Amended) The method of claim 17, wherein the neural network processing ~~comprises~~ performs a feature extraction ~~stage~~ in which said sequence of exponent sets is processed to determine said first variation values, and further performs a weighted routing ~~stage~~ in which said first variation values are weighted according to predetermined weighting values and routed to inputs of ~~a~~ the first neural layer, ~~a selection stage in which~~ and the second neural layer receiving an output of the first neural layer ~~is selected~~, and ~~an~~ output processing ~~stage~~ in which a coding strategy is assigned to said first exponent set based on the output of said selection stage and said second variation.

24. (Previously Presented) The method of claim 23, wherein a coding strategy is assigned to at least one subsequent exponent set on the basis of the output of said selection stage.

25. (Previously Presented) The method of claim 24, wherein the coding strategy assigned to the at least one subsequent exponent set is an exponent re-use strategy.

26. (Previously Presented) The method of claim 23, wherein the feature extraction stage comprises determining the first variation values according to

$\mathrm{Adiff}(E_i, E_j) = (\Sigma_m |e_{i,m} - e_{j,m}|)/n$

where Adiff is said first variation,

E_i is said first exponent set and E_j is a subsequent exponent set with $i > j$,

$E_i = (e_{i,0}, e_{i,1}, e_{i,2}, \ldots, e_{i,n-1})$,

$E_j = (e_{j,0}, e_{j,1}, e_{j,2}, \ldots, e_{j,n-1})$,

n is an integer representing the number of exponents in a said set of exponents, and

$m = 0, 1, 2, \ldots, n-1$.

27. (Previously Presented) The method of claim 26, wherein the processing carried out by the weighted routing stage and first neural layer includes determining

$$Y = \begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \cdots \\ \cdots \\ y_{b-1} \end{bmatrix} = \Gamma\left(\begin{bmatrix} 0 & 0 & 0 & \cdots & \cdots & 0 \\ 0 & w_{1,1} & 0 & \cdots & \cdots & 0 \\ 0 & w_{2,1} & w_{2,2} & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \cdots & \cdots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \cdots \\ \cdots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \cdots \\ \cdots \\ T_{b-1} \end{bmatrix} \right)$$

the operator $\Gamma[\bullet]$ is defined as:

$$\Gamma \begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \cdots \\ \cdots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \cdots \\ \cdots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of exponent sets in the sequence.

28. (Previously Presented) The method of claim 27, wherein the selection stage comprises selecting an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

29. (Previously Presented) The method of claim 28, wherein the plurality of exponent coding strategies comprises strategies $S_1, S_2, \ldots, S_c$, where $c \leq b$, corresponding to respective differential coding limits 1, 2, … ,c.

30. (Previously Presented) The method of claim 29, wherein the exponent coding strategy S_γ assigned to said first exponent set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5)$.

31. (Currently Amended) A digital audio encoder in which audio data is transformed into coefficients having mantissas and exponents arranged in a sequence of sets, ~~having~~ comprising:

a neural network processor comprising:

a first variation processor coupled to receive the exponents of sets from said sequence and to determine a first variation of exponent values between a first set and a plurality of subsequent sets in the sequence;

a second variation processor coupled to receive the exponents of said first set and determine a second variation between consecutive exponent values within said first set; and

~~a two-layer~~ the neural network processor ~~coupled to receive said first and second variations and~~ configured to select and assign an exponent coding strategy to said first set from a plurality of coding strategies on the basis of said first and second variations and a mean average

difference calculation between consecutive exponent values wherein the neural network processor includes a weighted routing stage in which said first variation values are weighted according to predetermined weighting values and routed to inputs of a first neural layer, a selection stage in which an output of the first neural layer is selected, and an output processing stage in which the coding strategy is assigned to said first exponent set based on the output of said selection stage and said second variation.

32. (Previously Presented) The audio encoder of claim 31, wherein each of the plurality of coding strategies correspond to a different differential coding limit.

33. (Previously Presented) The audio encoder of claim 31, wherein the neural network processor also selects and assigns an exponent coding strategy to at least one of the subsequent sets.

34. (Previously Presented) The audio encoder of claim 33, wherein the exponent coding strategy assigned to the at least one subsequent sets is an exponent re-use strategy.

35. (Canceled)

36. (Currently Amended) The audio coder of claim ~~35~~ 31, wherein the first variation processor is arranged to determine said first variation according to

$$Adiff(E_i, E_j) = (\Sigma_m |e_{i,m} - e_{j,m}|)/n$$

where Adiff is said first variation,

E_i is said first exponent set and E_j is a subsequent exponent set with $i > j$,

$E_i = (e_{i,0}, e_{i,1}, e_{i,2}, \ldots, e_{i,n-1})$,

$E_j = (e_{j,0}, e_{j,1}, e_{j,2}, \ldots, e_{j,n-1})$,

n is an integer representing the number of exponents in a said set of exponents, and

m = 0, 1, 2, …. , n-1.

37. (Previously Presented) The audio coder of claim 31, wherein the weighted routing stage of the neural network processor is arranged to determine

$$Y=\begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \cdots \\ \cdots \\ y_{b-1} \end{bmatrix} = \Gamma(\begin{bmatrix} 0 & 0 & 0 & \cdots & \cdots & 0 \\ 0 & w_{1,1} & 0 & \cdots & \cdots & 0 \\ 0 & w_{2,1} & w_{2,2} & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \cdots & \cdots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \cdots \\ \cdots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \cdots \\ \cdots \\ T_{b-1} \end{bmatrix})$$

the operator Γ[•] is defined as:

$$\Gamma\begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \cdots \\ \cdots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \cdots \\ \cdots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of sets in the sequence.

38. (Previously Presented) The audio encoder of claim 37, wherein the selection stage comprises selecting an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

39. (Currently Amended) The ~~method~~ audio encoder of claim 38, wherein the plurality of exponent coding strategies comprises strategies $S_1, S_2, \ldots, S_c$, where $c \leq b$, corresponding to respective differential coding limits $1, 2, \ldots, c$.

40. (Currently Amended) The ~~method~~ audio encoder of claim 39, wherein the exponent coding strategy S_γ assigned for encoding exponents in said first set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5)$.

41. (Currently Amended) The ~~method~~ audio encoder of claim 36, wherein the weighted routing stage of the neural network processor is arranged to determine

$$Y = \begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \ldots \\ \ldots \\ y_{b-1} \end{bmatrix} = \Gamma(\begin{bmatrix} 0 & 0 & 0 & \ldots & \ldots & 0 \\ 0 & w_{1,1} & 0 & \ldots & \ldots & 0 \\ 0 & w_{2,1} & w_{2,2} & \ldots & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \ldots & \ldots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \ldots \\ \ldots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \ldots \\ \ldots \\ T_{b-1} \end{bmatrix})$$

the operator $\Gamma[\bullet]$ is defined as:

$$\Gamma \begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \ldots \\ \ldots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \ldots \\ \ldots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of sets in the sequence.

42. (Currently Amended) The ~~method~~ audio encoder of claim 41, wherein the selection stage ~~comprises selecting~~ is arranged to select an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

43. (Currently Amended) The ~~method~~ audio encoder of claim 42, wherein the plurality of exponent coding strategies comprises strategies $S_1, S_2, \ldots, S_c$, where $c \leq b$, corresponding to respective differential coding limits 1, 2, ... ,c.

44. (Currently Amended) The ~~method~~ audio encoder of claim 43, wherein the exponent coding strategy S_γ assigned for encoding exponents in said first set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5)$.

45. (Currently Amended) A method for processing data in an audio data encoder, the data comprising a sequence of exponent sets each comprising a plurality of exponents, comprising the steps of:

determining via ~~the two-layer~~ neural network processing a first variation of exponent values within a first exponent set;

determining via ~~two-layer~~ the neural network processing a second variation of exponent values between said first exponent set and each subsequent exponent set in said sequence; and

assigning via the two-layer neural network processing an exponent coding strategy to the first exponent set based on the determined first and second variations, wherein the exponent coding strategy is assigned from a plurality of exponent coding strategies having different differential coding limits using a mean average difference calculation between consecutive exponent values, the neural network processing having first and second neural

layers, the first neural layer computing weighted sums of its inputs to determine the first variation, and the second neural layer determining a coding strategy for a selected output from the first neural layer.

46. (Previously Presented) The method of claim 45 further comprising coding said first exponent set according to the selected exponent coding strategy from a plurality of coding strategies, wherein each of the plurality of exponent coding strategies corresponds to a different differential coding limit.

47. (Previously Presented) The method of claim 45, wherein a neural network processor is used to receive the first and second variations and select and assign an exponent coding strategy to the first exponent set from a plurality of coding strategies on the basis of the first and second variations, wherein each of the plurality of coding strategies correspond to a different differential coding limit.

48. (Previously Presented) A method for processing data in an audio data encoder, the data including a sequence of exponent sets each comprising a plurality of exponents, the method comprising the steps of:

determining a first variation of exponent values within a first exponent set;

determining a second variation of exponent values between said first exponent set and each subsequent exponent set in said sequence

assigning an exponent coding strategy to the first exponent set based on the determined first and second variations,

wherein the steps of determining the first and second variations are performed utilizing neural network processing, the neural network processing comprising a feature extraction stage in which said sequence of exponent sets is utilized to determine said second variations, a weighted routing stage in which said second variations are weighted according to predetermined weighting values and routed to inputs of the first neural layer, a selection stage in which an output of the first neural layer is selected, and an output processing stage in which a

coding strategy is assigned to said first exponent set based on said first variation and the output of said selection stage, the feature extraction stage comprises determining:

$$\mathrm{Adiff}(E_i, E_j) = (\Sigma_m |e_{i,m} - e_{j,m}|)/n$$

where Adiff is said second variation,

E_i is said first exponent set and E_j is a subsequent exponent set with $j > i$,

$E_i = (e_{i,0}, e_{i,1}, e_{i,2}, \ldots, e_{i,n-1})$,

$E_j = (e_{j,0}, e_{j,1}, e_{j,2}, \ldots, e_{j,n-1})$,

n is an integer representing the number of exponents in a said set of exponents,

and

$m = 0, 1, 2, \ldots, n-1$.

49. (Previously Presented) The method of claim 48, wherein the processing carried out by the weighted routing stage and first neural layer includes determining

$$Y = \begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \cdots \\ \cdots \\ y_{b-1} \end{bmatrix} = \Gamma\left(\begin{bmatrix} 0 & 0 & 0 & \cdots & \cdots & 0 \\ 0 & w_{1,1} & 0 & \cdots & \cdots & 0 \\ 0 & w_{2,1} & w_{2,2} & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \cdots & \cdots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \cdots \\ \cdots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \cdots \\ \cdots \\ T_{b-1} \end{bmatrix} \right)$$

the operator $\Gamma[\bullet]$ is defined as:

$$\Gamma \begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \cdots \\ \cdots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \cdots \\ \cdots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of exponent sets in the sequence comprising said data.

50. (Previously Presented) The method of claim 49, wherein the selection stage comprises selecting an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

51. (Previously Presented) The method of claim 50, wherein the plurality of exponent coding strategies comprises strategies $S_1, S_2, \ldots, S_c$, where $c \leq b$, corresponding to differential coding limits $1, 2, \ldots, c$.

52. (Previously Presented) The method of claim 51, wherein the exponent coding strategy S_γ assigned to said first exponent set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5)$.

53. (Previously Presented) A method for coding audio data having a sequence of exponent sets each comprising a plurality of exponents, the method comprising the steps of:

determining a first variation of exponent values between a first exponent set in the sequence and each subsequent exponent set in said sequence;

selecting an exponent coding strategy for said first exponent set from a plurality of exponent coding strategies on the basis of said first variation; and

coding said first exponent set according to the selected exponent coding strategy,

wherein the step of selecting the exponent coding strategy for the first and second exponent set is performed utilizing neural network processing, the neural network processing comprising a feature extraction stage in which said sequence of exponent sets is processed to determine said first variation values, a weighted routing stage in which said first variation values are weighted according to predetermined weighting values and routed to inputs of a first neural layer, a selection stage in which an output of the first neural layer is selected, and an output

processing stage in which a coding strategy is assigned to said first exponent set based on the output of said selection stage and said second variation, wherein the feature extraction stage comprises determining the first variation values according to:

$$\mathrm{Adiff}(E_i, E_j) = (\Sigma_m |e_{i,m} - e_{j,m}|)/n$$

where Adiff is said first variation,

E_i is said first exponent set and E_j is a subsequent exponent set with $i > j$,

$E_i = (e_{i,0}, e_{i,1}, e_{i,2}, \ldots, e_{i,n-1})$,

$E_j = (e_{j,0}, e_{j,1}, e_{j,2}, \ldots, e_{j,n-1})$,

n is an integer representing the number of exponents in a said set of exponents, and

$m = 0, 1, 2, \ldots, n-1$.

54. (Previously Presented) The method of claim 53, wherein the processing carried out by the weighted routing stage and first neural layer includes determining

$$Y = \begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \ldots \\ \ldots \\ y_{b-1} \end{bmatrix} = \Gamma(\begin{bmatrix} 0 & 0 & 0 & \ldots & \ldots & 0 \\ 0 & w_{1,1} & 0 & \ldots & \ldots & 0 \\ 0 & w_{2,1} & w_{2,2} & \ldots & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots & 0 \\ \ldots & \ldots & \ldots & \ldots & \ldots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \ldots & \ldots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \ldots \\ \ldots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \ldots \\ \ldots \\ T_{b-1} \end{bmatrix})$$

the operator $\Gamma[\bullet]$ is defined as:

$$\Gamma\begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \ldots \\ \ldots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \ldots \\ \ldots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of exponent sets in the sequence.

55. (Previously Presented) The method of claim 54, wherein the selection stage comprises selecting an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

56. (Previously Presented) The method of claim 55, wherein the plurality of exponent coding strategies comprises strategies $S_1, S_2, \dots, S_c$, where $c \leq b$, corresponding to respective differential coding limits 1, 2, ... ,c.

57. (Previously Presented) The method of claim 56, wherein the exponent coding strategy S_γ assigned to said first exponent set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $$\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5).$$

58. (Previously Presented) A digital audio encoder in which audio data is transformed into coefficients having mantissas and exponents arranged in a sequence of sets, having:

a first variation processor coupled to receive the exponents of sets from said sequence and to determine a first variation of exponent values between a first set and a plurality of subsequent sets in the sequence;

a second variation processor coupled to receive the exponents of said first set and determine a second variation between consecutive exponent values within said first set; and

a neural network processor coupled to receive said first and second variations and to select and assign an exponent coding strategy to said first set from a plurality of coding strategies on the basis of said first and second variations,

wherein the neural network processor includes a weighted routing stage in which said first variation values are weighted according to predetermined weighting values and routed to inputs of a first neural layer, a selection stage in which an output of the first neural layer is selected, and an output processing stage in which a coding strategy is assigned to said first exponent set based on the output of said selection stage and said second variation, wherein the first variation processor is arranged to determine said first variation according to:

$\mathrm{Adiff}(E_i, E_j) = (\Sigma_m |e_{i,m} - e_{j,m}|)/n$

where Adiff is said first variation,

E_i is said first exponent set and E_j is a subsequent exponent set with $i > j$,

$E_i = (e_{i,0}, e_{i,1}, e_{i,2}, \ldots, e_{i,n-1})$,

$E_j = (e_{j,0}, e_{j,1}, e_{j,2}, \ldots, e_{j,n-1})$,

n is an integer representing the number of exponents in a said set of exponents, and

$m = 0, 1, 2, \ldots, n-1$.

59. (Currently Amended) The ~~method~~ encoder of claim 58, wherein the weighted routing stage of the neural network processor is arranged to determine

$$Y = \begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \cdots \\ \cdots \\ y_{b-1} \end{bmatrix} = \Gamma(\begin{bmatrix} 0 & 0 & 0 & \cdots & \cdots & 0 \\ 0 & w_{1,1} & 0 & \cdots & \cdots & 0 \\ 0 & w_{2,1} & w_{2,2} & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \cdots & \cdots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \cdots \\ \cdots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \cdots \\ \cdots \\ T_{b-1} \end{bmatrix})$$

the operator $\Gamma[\bullet]$ is defined as:

$$\Gamma \begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \cdots \\ \cdots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \cdots \\ \cdots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of sets in the sequence.

60. (Currently Amended) The ~~method~~ encoder of claim 59, wherein the selection stage comprises selecting an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

61. (Currently Amended) The ~~method~~ encoder of claim 60, wherein the plurality of exponent coding strategies comprises strategies $S_1, S_2, \ldots, S_c$, where $c \leq b$, corresponding to respective differential coding limits 1, 2, ... ,c.

62. (Currently Amended) The ~~method~~ encoder of claim 61, wherein the exponent coding strategy S_γ assigned for encoding exponents in said first set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5)$.

63. (Previously Presented) A digital audio encoder in which audio data is transformed into coefficients having mantissas and exponents arranged in a sequence of sets, having:

a first variation processor coupled to receive the exponents of sets from said sequence and to determine a first variation of exponent values between a first set and a plurality of subsequent sets in the sequence;

a second variation processor coupled to receive the exponents of said first set and determine a second variation between consecutive exponent values within said first set; and

a neural network processor coupled to receive said first and second variations and to select and assign an exponent coding strategy to said first set from a plurality of coding strategies on the basis of said first and second variations,

wherein the weighted routing stage of the neural network processor is arranged to determine:

$$Y = \begin{bmatrix} y_0 \\ y_1 \\ y_2 \\ \cdots \\ \cdots \\ y_{b-1} \end{bmatrix} = \Gamma(\begin{bmatrix} 0 & 0 & 0 & \cdots & \cdots & 0 \\ 0 & w_{1,1} & 0 & \cdots & \cdots & 0 \\ 0 & w_{2,1} & w_{2,2} & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ \cdots & \cdots & \cdots & \cdots & \cdots & 0 \\ 0 & w_{b-1,1} & w_{b-1,2} & \cdots & \cdots & w_{b-1,b-1} \end{bmatrix} \begin{bmatrix} 0 \\ z_1 \\ z_2 \\ \cdots \\ \cdots \\ z_{b-1} \end{bmatrix} = \begin{bmatrix} 0 \\ T_1 \\ T_2 \\ \cdots \\ \cdots \\ T_{b-1} \end{bmatrix})$$

the operator $\Gamma[\bullet]$ is defined as:

$$\Gamma \begin{bmatrix} \gamma_0 \\ \gamma_1 \\ \gamma_2 \\ \cdots \\ \cdots \\ \gamma_{b-1} \end{bmatrix} = \begin{bmatrix} f(\gamma_0) \\ f(\gamma_1) \\ f(\gamma_2) \\ \cdots \\ \cdots \\ f(\gamma_{b-1}) \end{bmatrix}$$

where $f(\gamma_i)$ is +1 if $\gamma \geq 0$ else it is 0,

Y represents outputs of the first neural layer,

T are threshold values determined during a training phase,

w are weighting values determined during the training phase, and

b is the number of sets in the sequence.

64. (Previously Presented) The audio encoder of claim 63, wherein the selection stage comprises selecting an output y_a of the first neural layer such that $y_a = 1$ and a is maximum for $i < a < b$.

65. (Currently Amended) The ~~method~~ audio encoder of claim 64, wherein the plurality of exponent coding strategies comprises strategies S_1, S_2, ... , S_c, where $c \leq b$, corresponding to respective differential coding limits 1, 2, ... ,c.

66. (Currently Amended) The ~~method~~ audio encoder of claim 65, wherein the exponent coding strategy S_γ assigned for encoding exponents in said first set E_i is selected according to

$$\gamma = \max[\min(a+1, \sigma(E_i)), 1]$$

where $\sigma(E_i) = floor((\Sigma_j \| e_{i,j+1} - e_{i,j} \| / n) + 0.5)$.